

PROJECT NUMBER: 1503  
PROJECT TITLE: Modified Smoking Materials  
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PERIOD COVERED: July, 1987

#### FOAMED FILLER BINDER

- A. **Objective:** To develop a process for applying a subjectively acceptable foamed binder to the tobacco filler during making to improve cigarette coal strength, reduce loose ends, increase firmness and allow for weight reductions.
- B. **Results:** A series of degraded pectin binders with average molecular weights ranging from ~2000 - 8000 MW was evaluated on Cambridge Lights cigarettes. These pectin binders were prepared in-house using the 5 gallon lab vessel. Included in these evaluations were pectin binders received from Grindsted (a commercial pectin supplier). The pectin binders with molecular weights from 3000 to 5000 gave promising results. The pectin binder with an average molecular weight of 4000 applied to the cigarette at a 0.3% addition rate using a 35% binder solution showed the most potential for firmness improvement, yielding a 0.25mm firmness improvement at equal OV's (cigarettes equilibrated in a 56% RH cabinet). At this addition rate, the pack OV increased by ~0.4% due to the binder application, yielding a pack firmness (unequilibrated) improvement of 0.05 units. Follow-up runs are in progress where the OV of the tobacco was adjusted to compensate for the 0.4% increase in moisture. This same binder solution was also applied to the cigarette at a 1.0% addition rate yielding a firmness improvement of approximately 0.5mm units at equal OV's. At this 1% addition rate, the pack moisture was increased by ~1.2% yielding a pack firmness loss of 0.1 units. Additional runs are also in progress for this add-on rate where the tobacco OV was adjusted to compensate for the 1.2% increase in pack moisture.

Binder solutions with glycerin added to the formulation were also prepared in effort to increase the volume of binder added at the low pectin addition rates (thus increasing the number of bound shreds) without significantly increasing the amount of moisture added. A 0.2 g/cc foam density was achieved with the addition of 1% foaming agent (yucca concentrate). This formulation will be applied to the cigarette and evaluated for firmness improvement.

Tobacco filler is being prepared where the degraded pectin is added to the tobacco via the total blend casing. This technique is being explored as a method of facilitating blend and flavor development for the foam bound cigarettes.

The pilot plant process for the continuous degradation of pectin binders was installed and started up this month. Start up runs have gone smoothly to date. Problems with the fine tuning of the temperature controller were identified and are being rectified. Additional trials are currently in progress in an effort to establish process operating conditions.

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- C. Plans: Complete evaluation of the 3000 to 5000 MW pectin binders at the 0.3 and 1.0% add-on rates using moisture adjusted feed tobacco. Provide tobacco with pectin binder applied through the total blend casing to product development for blend and flavor development. Complete start-up trials on the continuous degradation process and begin producing thermally degraded pectin for evaluation on foam bound rods.

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